UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/565,043 | 01/18/2006 | Yoshiyuki Suzuri | 06022/HG | 3686 |

1933 7590 04/29/2008

FRISHAUF, HOLTZ, GOODMAN & CHICK, PC
220 Fifth Avenue
16TH Floor
NEW YORK, NY 10001-7708

| EXAMINER | |
|---|---|
| RALEIGH, DONALD L | |
| **ART UNIT** | **PAPER NUMBER** |
| 2879 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 04/29/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/565,043 | SUZURI ET AL. | |
| | Examiner | Art Unit | |
| | DONALD L. RALEIGH | 2879 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *18 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

Receipt of the Amendment, filed on January 18, 2006, is acknowledged.

Claims 1-46 are pending in the instant application.

### *Priority*

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,3-4,12,24-26,34,38 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al (US PG Pub. No. 2003/0059647) in view of Lamansky et al. (US 2002/0182441) and further in view of Motomatsu (US Patent No. 6,541,909).

Regarding Claim 1 , Thompson (647) discloses, an organic electroluminescent element (Paragraph [0005], line 1 (OLED)) comprising an anode (Paragraph [0094]) and a cathode (Paragraph [0094]) having therebetween a light emitting layer (Paragraph [0098]) containing a phosphorescent compound (Paragraph [0100]), and hole blocking layer 1 (Paragraph [0101]) provided adjacent to the light emitting layer and between the light emitting layer and the cathode (Paragraph [0102], lines 8-11, places the hole blocking layer between the EL layer and the cathode), wherein hole blocking layer 1 contains a phosphorescent compound (Paragraph [0109], lines 29-32, (Firpic, which is a blue-phosphorescent compound)); and a content of the

phosphorescent compound (Firpic) contained in hole blocking layer 1 is in the range of 0.1 to 50% of a content of the phosphorescent compound contained in the light emitting layer.

Thompson fails to disclose that the same phosphorescent compound is contained in the hole blocking layer (Firpic) and the light emitting layer or that a content of the phosphorescent compound (Firpic) contained in hole blocking layer 1 is in the range of 0.1 to 50% of a content of the phosphorescent compound contained in the light emitting layer.

In the same field of endeavor, Lamansky teaches in Paragraph [0097], lines 14-15 using Firpic for the light emitting layer in order to produce improved electroluminescence, particularly in the blue region of the visible spectrum (abstract, lines 1-3)

Furthermore, in the same field of endeavor, Motomatsu teaches doping the hole blocking layer (7) with the same kind of dopant as the luminescent layer (4) (Column 4, lines 35-39) and lines 7-10 teaches that the concentration of dopant is less in the hole blocking layer (7) than it is in the luminescent layer (4)(i.e. is less than 50%) in order to sufficiently control a change of shade and hold a stable chromaticity.(Column 2, lines 19-23)

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use the same phosphorescent material in both the hole blocking layer and the light emitting layer as an obvious economy of materials. Furthermore, it would have been obvious to use a concentration of dopant in the hole blocking layer that is less than in the luminescent layer in order to sufficiently control a change of shade and hold a stable chromaticity.

Regarding Claim 3, Thompson (647) discloses an organic electroluminescent element in Paragraph [0109], lines 24-27 using Firpic for the hole blocking layer.

However, Thompson fails to exemplify the organic electroluminescent element wherein the phosphorescent compound contained in the light emitting layer is the same as the phosphorescent compound contained in hole blocking layer 1.

In the same field of endeavor, Lamansky teaches in Paragraph [0097], lines 14-15 using Firpic for the light emitting layer in order to produce improved electroluminescence, particularly in the blue region of the visible spectrum (abstract, lines 1-3)

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the use of Firpic in the light emitting layer as taught by Lamansky and the hole blocking layer, as taught by Thompson in order to produce improved electroluminescence, particularly in the blue region of the visible spectrum (abstract, lines 1-3)

Regarding Claim 4, Thompson (647) discloses the organic electroluminescent element of claim 1, wherein the phosphorescent compound contained in the light emitting layer is different from the phosphorescent compound contained in hole blocking layer 1. (Paragraph [0109], lines 24-27 discloses using Firpic for the hole blocking layer while using CBP doped with $Ir(ppy)_3$ is used for the emissive layer (light emitting layer).

Regarding Claim 12, Thompson (647) discloses an organic electroluminescent element in Paragraph [0109], lines 24-27 using Firpic for the hole blocking layer.

However, Thompson fails to exemplify the organic electroluminescent element wherein the phosphorescent compound contained in the light emitting layer is the same as the phosphorescent compound contained in hole blocking layer 1.

In the same field of endeavor, Lamansky teaches in Paragraph [0097], lines 14-15 using Firpic for the light emitting layer in order to produce improved electroluminescence, particularly in the blue region of the visible spectrum (abstract, lines 1-3)

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the use of Firpic in the light emitting layer as taught by Lamansky and the hole blocking layer, as taught by Thompson in order to produce improved electroluminescence, particularly in the blue region of the visible spectrum (abstract, lines 1-3)

Regarding Claim 24, Thompson (647) discloses a display (paragraph [0004], line 9 (flat panel display) comprising an organic electroluminescent element, (line 7).

Regarding Claim 25, Thompson (647) discloses an illumination device (abstract, line 1, light emitting device) comprising an organic electroluminescent element (Paragraph [0005], line 1, (OLED)).

Regarding Claims 26 and 34, Thompson (647) fails to exemplify the illumination device wherein a display comprises a liquid crystal cell and the illumination device.

Lamansky teaches in (Paragraph [0010], lines 14-15) using illumination devices (organic light emitting devices (line 1)) in liquid crystal displays because of their bright colors, wide viewing angle and low power requirements (lines 9-12).

It would have been obvious to one of ordinary skills in the art, at the time of the invention, to incorporate the liquid crystal device of Lamansky into the illumination device of Thompson to provide bright colors, wide viewing angle and low power requirements in the liquid crystal device.

Regarding Claims 38 and 46, Thompson (647) fails to exemplify the illumination device wherein a display comprising a liquid crystal cell and the illumination device.

Lamansky teaches in (Paragraph [0010], lines 14-15) using illumination devices (organic light emitting devices (line 1)) in liquid crystal displays because of their bright colors, wide viewing angle and low power requirements (lines 9-12)

It would have been obvious to one of ordinary skills in the art, at the time of the invention, to incorporate the liquid crystal device of Lamansky into the illumination device of Thompson to provide bright colors, wide viewing angle and low power requirements in the liquid crystal device.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Wolk et al (US PG Pub. No. 2002/0197554).

Regarding Claim 2, Thompson (647) fails to exemplify the electroluminescent element further comprising a hole blocking layer 2 provided adjacent to hole blocking layer 1 and between hole blocking layer 1 and the cathode.

However, in the same field of endeavor, Wolk teaches a transfer layer containing two layers both of which can be a hole blocking layer (Paragraph [0075], lines 1-15) in order that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer (Paragraph [0073], lines 1-6). Also, Paragraph [0007], lines 1-6 teaches that the transfer layers are between the anode and the cathode.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the two adjacent hole blocking layers as taught by Wolk into the electroluminescent element of Thompson in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer.

Claims 5, 7-8, 14,18, 28-29, and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Yamazaki (US Patent No. 6,580,213) , Epstein et al (US PG Pub. NO. 2004/00493251) and Motomatsu (909)

Regarding Claims 5 and 7, Thompson (647) discloses an organic electroluminescent element (Paragraph [0005], line 1 (OLED) comprising an anode (line 8) and a cathode (line 6) having there between a light emitting layer (lines 13-15) containing a phosphorescent compound (Paragraph [0095], lines 32-33 (luminescent material) , and electron blocking layer 1 provided adjacent to the light emitting layer and between the light emitting layer and the anode, wherein electron blocking layer 1 contains a phosphorescent compound (Paragraph [0101],

lines 9-10 teaches that the blocking layers (referring to electron or hole blocking layers) can include compounds capable of emitting (phosphorescent)).

Thompson (647) fails to disclose that the same phosphorescent compound is contained in the electron blocking layer and the light emitting layer (as is required in Claim 7) or that a content of the phosphorescent compound contained in electron blocking layer 1 is in the range of 0.1 to 50% of a content of the phosphorescent compound contained in the light emitting layer.

In the same field of endeavor, Yamazaki teaches in Column 8, lines 60-65 using PVK as the light emitting layer (emission layer) in order to alter the LUMO or HUMO levels in the interior of the emission layer.

In the same field of endeavor, Epstein teaches Column 3, lines 3-4 using PVK in an electron blocking layer to improve the device efficiency and brightness. (PVK is luminescent).

Furthermore, in the same field of endeavor, Motomatsu teaches doping the electron blocking layer (8) with the same kind of dopant as the luminescent layer (4) (Column 6, lines 35-39) and lines 1-5 teaches that the same kind of dopant is used in both layers and that the concentration of dopant is less in the electron blocking layer (8) than it is in the luminescent layer (4)(i.e. it is less than 50%) in order to sufficiently control a change of shade and hold a stable chromaticity(Column 2, lines 19-23).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the use of PVK in both the light emitting layer and the electron blocking layer, as taught by Yamazaki and Epstein into the electroluminescent element of Thompson in order to alter the LUMO or HUMO levels in the interior of these layers and improve the device efficiency and brightness and to dope the electron blocking layer with a lower concentration than in the luminescent layer, as taught by Motomatsu, in order to sufficiently control a change of shade and hold a stable chromaticity.

Regarding Claim 8, Thompson (647) fails to exemplify the organic electroluminescent element wherein the phosphorescent compound contained in the light emitting layer is different from the phosphorescent compound contained in electron blocking layer 1.

Thompson (647) discloses in Paragraph [0109], lines 24-25 an emissive layer (light emitting layer) comprising CBP doped with Ir(ppy).

In the same field of endeavor, Epstein (251) teaches Column 3, lines 3-4 using PVK in an electron blocking layer to improve the device efficiency and brightness. (PVK is luminescent)

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the PVK of Epstein into the device of Thompson with Ir(ppy) as a luminescent material in order to improve the device efficiency and brightness.

Regarding Claim 14, Thompson (647) fails to exemplify the organic electroluminescent element wherein the phosphorescent compound contained in the light emitting layer is the same as the phosphorescent compound contained in electron blocking layer 1.

In the same field of endeavor, Epstein (251) teaches Column 3, lines 3-4 using PVK in an electron blocking layer to improve the device efficiency and brightness. (PVK is luminescent).

In the same field of endeavor, Yamazaki (213) teaches in Column 8, lines 60-65 using PVK as the light emitting layer (emission layer) in order to alter the LUMO or HUMO levels in the interior of the emission layer.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the use of PVK in both the light emitting layer and the electron blocking layer, as taught by Yamazaki and Epstein into the electroluminescent element of Thompson in order to alter the LUMO or HUMO levels in the interior of these layers and improve the device efficiency and brightness.

Regarding Claim 18, Thompson (647) discloses an organic electroluminescent element (Paragraph [0005], line 1 (OLED)) comprising an anode (Paragraph [0094], and a cathode (Paragraph [0094] having therebetween a light emitting layer (Paragraph [0098] containing a phosphorescent compound (Paragraph [0100]) , and electron blocking layer 1 (Paragraph [0101]) provided adjacent to the light emitting layer and between the light emitting layer and the anode (Paragraph [0105], lines 9-12).

Thompson fails to exemplify an organic electroluminescent element wherein electron blocking layer 1 contains a phosphorescent compound so that an amount of light emitted from electron blocking layer 1 is in the range of 0.l to 50% of an amount of light emitted from the light emitting layer.

In the same field of endeavor, Yamazaki teaches in Column 8, lines 60-65 using PVK as the light emitting layer (emission layer) in order to alter the LUMO or HUMO levels in the interior of the emission layer.

In the same field of endeavor, Epstein teaches Column 3, lines 3-4 using PVK in an electron blocking layer to improve the device efficiency and brightness. (PVK is luminescent).

Furthermore, in the same field of endeavor, Motomatsu teaches doping the electron blocking layer (8) with the same kind of dopant as the luminescent layer (4) (Column 6, lines 1-5 and column 6, lines 21-23 teaches that the concentration of dopant is less in the electron blocking layer (8) than it is in the luminescent layer (4)(i.e. is less than 50%)) in order to sufficiently control a change of shade and hold a stable chromaticity.(Column 2, lines 19-23).

Since the same material is taught in both layers (electron blocking and light emitting) and the amount of material ranges from 0.1 to 50% of the light emitting layer than the emissions that occur would be 0.1 to 50% of the light emitting layer.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the identical materials and dopant ranges as taught by Motomatsu into the electroluminescent element as taught by Thompson (647) in order to realize a light emission range of 0.1 to 50% as an inherent characteristic of the materials utilized.

Regarding Claim 28, Thompson (647) discloses a display (paragraph [0004], line 9 (flat panel display) comprising an organic electroluminescent element, (line 7).

Regarding Claim 29, Thompson (647) discloses an illumination device (abstract, line 1, light emitting device) comprising an organic electroluminescent element (Paragraph [0005], line 1, (OLED)).

Regarding Claims 40, Thompson (647) discloses a display (paragraph [0004], line 9 (flat panel display) comprising an organic electroluminescent element, (line 7).

Regarding Claims 41, Thompson (647) discloses an illumination device (abstract, line 1, light emitting device) comprising an organic electroluminescent element (Paragraph [0005], line 1, (OLED)).

Claims 6 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Yamazaki (213), Epstein (251), Motomatsu (909) and further in view of Wolk (554)

Regarding Claim 6, Thompson (647) discloses in Paragraph [01015], lines 1-8, an electron blocking layer adjacent to the anode and in Paragraph [0046] discloses that there may be more than one electron blocking layer. But, Thompson fails to exemplify the organic electroluminescent element wherein the organic electroluminescent element further comprises electron blocking layer 2 provided adjacent to electron blocking layer 1 and between electron blocking layer 1 and the anode.

In the same field of endeavor, Wolk teaches a transfer layer containing two layers both of which can be an electron blocking layer (Paragraph [0075], lines 1-15) in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer (Paragraph [0073], lines 1-6). Also, Paragraph [0007], lines 1-6 teaches that the transfer layers are between the anode and the cathode.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the two adjacent electron blocking layers as taught by Wolk into the electroluminescent element of Thompson in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer.

Regarding Claim 19, Thompson fails to exemplify the electroluminescent element further comprising an electron blocking layer 2 provided adjacent to electron blocking layer 1 and between electron blocking layer 1 and the cathode.

In the same field of endeavor, Wolk teaches a transfer layer containing two layers both of which can be a electron blocking layer (Paragraph [0075], lines 1-15) in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer (Paragraph [0073], lines 1-6). Also, Paragraph [0007], lines 1-6 teaches that the transfer layers are between the anode and the cathode.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the two adjacent electron blocking layers as taught by Wolk into the electroluminescent element of Thompson in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer.

Claims 9, 13, 16, 20, 32-33, 36-37, and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Motomatsu (909).

Regarding Claim 9, Thompson (647) discloses an organic electroluminescent element (Paragraph [0005], line 1 (OLED)) comprising an anode (line 8) and a cathode (line 6) having therebetween a light emitting layer (lines 13-15) containing a phosphorescent compound (Paragraph [0095], lines 32-33 (luminescent material); hole blocking layer 1 provided adjacent to the light emitting layer and between the light emitting layer and the cathode (Paragraph [0102], lines 8-11 places the hole blocking layer between the EL layer and the cathode); and electron blocking layer 1 provided adjacent to the light emitting layer and between the light emitting layer and the anode (Column 22, lines 27-35 ) , wherein hole blocking layer 1 contains a phosphorescent compound Paragraph [0109], lines 29-32, (Firpic is a phosphorescent compound));

Thompson fails to disclose that a content of the phosphorescent compound contained in hole blocking layer 1 is in the range of 0.1 to 50% of a content of the phosphorescent compound contained in the light emitting layer; electron blocking layer 1 contains a phosphorescent compound; and a content of the phosphorescent compound contained in electron blocking layer 1 is in the range of 0.1 to 50% of a content of the phosphorescent compound contained in the light emitting layer.

In the same field of endeavor, Motomatsu teaches doping the hole blocking layer (7) with the same kind of dopant as the luminescent layer (4) (Column 4, lines 35-39) and lines 7-10 teaches that the concentration of dopant is less in the hole blocking layer (7) than it is in the luminescent layer (4)(i.e. is less than 50%) . Also, Motomatsu teaches doping the electron blocking layer (8) with the same kind of dopant as the luminescent layer (4) (Column 6, lines 1-5) and that the concentration of dopant is less in the electron blocking layer (8) than it is in the luminescent layer (4) (i.e. it is less than 50%) in order to sufficiently control a change of shade and hold a stable chromaticity, (Column 2, lines 19-23)).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use the same phosphorescent material in both the hole blocking layer and the light emitting layer or the electron blocking layer and the light emitting layer, as taught by Motomatsu, as an obvious economy of materials.

Furthermore, it would have been obvious to use a concentration of dopant in the hole blocking layer or the electron blocking layer that is less than in the luminescent layer, as taught by Motomatsu, in order to sufficiently control a change of shade and hold a stable chromaticity.

Regarding Claim 13, Thompson (647) discloses the organic electroluminescent element wherein the phosphorescent compound contained in the light emitting layer is different from the phosphorescent compound contained in hole blocking layer 1.
(Paragraph [0109], lines 24-27 discloses using Firpic for the hole blocking layer while using CBP doped with $Ir(ppy)_3$ is used for the emissive layer (light emitting layer).

Regarding Claim 16, Thompson (647) discloses an organic electroluminescent element (Paragraph [0005], line 1 (OLED)) comprising an anode (Para. [0094]) and a cathode (Para. [0094]) having therebetween a light emitting layer (Para. [0098]) containing a phosphorescent compound (Para. [0100]), and hole blocking layer 1 (Para. [0101]), provided adjacent to the light emitting layer and between the light emitting layer and the cathode (Para. [0102], lines 8-11), wherein hole blocking layer 1 contains a phosphorescent compound (Para. [0109]),

Thompson (647) fails to disclose that an amount of light emitted from hole blocking layer 1 is in the range of 0.1 to 50% of an amount of light emitted from the light emitting layer.

In the same field of endeavor, Motomatsu teaches doping the hole blocking layer (7) with the same kind of dopant as the luminescent layer (4) (Column 4, lines 35-39) and lines 7-10 teaches that the concentration of dopant is less in the hole blocking layer (7) than it is in the

luminescent layer (4)(i.e. is less than 50%) in order to sufficiently control a change of shade and hold a stable chromaticity.(Column 2, lines 19-23).

Also, Motomatsu teaches doping the electron blocking layer (8) with the same kind of dopant as the luminescent layer (4) (Column 6, lines 1-5) and that the concentration of dopant is less in the electron blocking layer (8) than it is in the luminescent layer (4) (i.e. it is less than 50%), in order to sufficiently control a change of shade and hold a stable chromaticity (Column 2, lines 19-23).

Since the same material is taught in both layers (hole blocking and light emitting or electron blocking and light emitting) and the amount of material ranges from 0.1 to 50% of the light emitting layer than the emissions that occur would be within the range of 0.1 to 50% of the light emitting layer.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the identical materials and dopant ranges as taught by Motomatsu into the electroluminescent element as taught by Thompson in order to realize a light emission range of 0.1 to 50% as an inherent characteristic of the quantity and materials utilized.

Regarding Claim 20, Thompson discloses an organic electroluminescent element (Paragraph [0005], line 1 (OLED)) comprising an anode (Paragraph [0094] and a cathode (Paragraph [0094] having therebetween a light emitting layer (Paragraph [0098]) containing a phosphorescent compound (Paragraph [0100]); hole blocking layer 1 (Paragraph [0101]) provided adjacent to the light emitting layer (Paragraph [0102]) an electron blocking layer 1 provided adjacent to the light emitting layer (Paragraph [0095] lines 28-31 teaches that the hole blocking and electron blocking may flank the emissive (EL) layer) and between the light emitting layer and the anode (Para. [0102], lines 8-11), wherein hole blocking layer 1 contains a phosphorescent compound (Paragraph [0109], lines 29-32)

Thompson fails to disclose that an amount of light emitted from hole blocking layer 1 is in the range of 0.1 to 50% of an amount of light emitted from the light emitting layer; and electron blocking layer 1 contains a phosphorescent compound so that an amount of light emitted from electron blocking layer 1 is in the range of 0.1 to 50% of an amount of light emitted from the light emitting layer.

In the same field of endeavor, Motomatsu teaches doping the hole blocking layer (7) with the same kind of dopant as the luminescent layer (4) (Column 4, lines 35-39) and lines 7-10 teaches that the concentration of dopant is less in the hole blocking layer (7) than it is in the luminescent layer (4)(i.e. is less than 50%) . Also, Motomatsu teaches doping the electron blocking layer (8) with the same kind of dopant as the luminescent layer (4) (Column 6, lines 1-5) and that the concentration of dopant is less in the electron blocking layer (8) than it is in the luminescent layer (4) (i.e. it is less than 50%) in order to sufficiently control a change of shade and hold a stable chromaticity (Column 2, lines 19-23).

Since the same material is taught in both layers (hole blocking and light emitting or electron blocking and light emitting) and the amount of material ranges from 0.1 to 50% of the light emitting layer than the emissions that occur would be 0.1 to 50% of the light emitting layer.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the identical materials and dopant ranges as taught by Motomatsu into the electroluminescent element as taught by Thompson in order to realize a light emission range of 0.1 to 50% as an inherent characteristic of the quantity and materials utilized.

Regarding Claim 32. Thompson (647) discloses a display (paragraph [0004], line 9 (flat panel display) comprising an organic electroluminescent element, (line 7).

Regarding Claim 33, Thompson (647) discloses an illumination device (abstract, line 1, light emitting device) comprising an organic electroluminescent element (Paragraph [0005], line 1, (OLED)).

Regarding Claims 36 and 44, Thompson (647) discloses a display (paragraph [0004], line 9 (flat panel display) comprising an organic electroluminescent element, (line 7).

Regarding Claims 37 and 45, Thompson (647) discloses an illumination device (abstract, line 1, light emitting device) comprising an organic electroluminescent element (Paragraph [0005], line 1, (OLED)).

Claims 10-11, 17 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Motomatsu (909) and Wolk (554).

Regarding Claim 10, Thompson (647) discloses in Paragraph [0102], lines 1-8, a hole blocking layer adjacent to the cathode. But, Thompson fails to exemplify the organic electroluminescent element wherein it further comprises hole blocking layer 2 provided adjacent to hole blocking layer 1 and between hole blocking layer 1 and the cathode.

In the same field of endeavor, Wolk teaches a transfer layer containing two layers both of which can be a hole blocking layer (Paragraph [0075], lines 1-15) in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer (Paragraph [0073], lines 1-6). Also, Paragraph [0007], lines 1-6 teaches that the transfer layers are between the anode and the cathode.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the two adjacent hole blocking layers, as taught by Wolk, into the electroluminescent element of Thompson in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer.

Regarding Claim 11, Thompson (647) discloses in Paragraph [01015], lines 1-8, an electron blocking layer adjacent to the anode and in Paragraph [0046] discloses that there may be more than one electron blocking layer. But, Thompson fails to exemplify the organic electroluminescent element wherein the organic electroluminescent element further comprises electron blocking layer 2 provided adjacent to electron blocking layer 1 and between electron blocking layer 1 and the anode.

In the same field of endeavor, Wolk teaches a transfer layer containing two layers both of which can be an electron blocking layer (Paragraph [0075], lines 1-15) in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer (Paragraph [0073], lines 1-6). Also, Paragraph [0007], lines 1-6 teaches that the transfer layers are between the anode and the cathode.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the two adjacent electron blocking layers as taught by Wolk into the electroluminescent element of Thompson in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer.

Regarding Claim 17, Thompson (647) fails to exemplify the electroluminescent element further comprising a hole blocking layer 2 provided adjacent to hole blocking layer 1 and between hole blocking layer 1 and the cathode.

In the same field of endeavor, Wolk teaches a transfer layer containing two layers both of which can be a hole blocking layer (Paragraph [0075], lines 1-15) in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer (Paragraph [0073], lines 1-6). Also, Paragraph [0007], lines 1-6 teaches that the transfer layers are between the anode and the cathode.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the two adjacent hole blocking layers as taught by Wolk into the electroluminescent element of Thompson in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer.

Regarding Claim 21, Thompson (647) fails to exemplify the electroluminescent element further comprising a hole blocking layer 2 provided adjacent to hole blocking layer 1 and between hole blocking layer 1 and the cathode.

In the same field of endeavor, Wolk teaches a transfer layer containing two layers both of which can be a hole blocking layer (Paragraph [0075], lines 1-15) in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer (Paragraph [0073], lines 1-6). Also, Paragraph [0007], lines 1-6 teaches that the transfer layers are between the anode and the cathode.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the two adjacent hole blocking layers as taught by Wolk into the electroluminescent element of Thompson in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer.

Regarding Claim 22, Thompson (647) discloses in Paragraph [01015], lines 1-8, an electron blocking layer adjacent to the anode and in Paragraph [0046] discloses that there may be more than one electron blocking layer. But, Thompson fails to exemplify the organic electroluminescent element wherein the organic electroluminescent element further comprises electron blocking layer 2 provided adjacent to electron blocking layer 1 and between electron blocking layer 1 and the anode.

In the same field of endeavor, Wolk teaches a transfer layer containing two layers both of which can be an electron blocking layer (Paragraph [0075], lines 1-15) in order to that the

important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer (Paragraph [0073], lines 1-6). Also, Paragraph [0007], lines 1-6 teaches that the transfer layers are between the anode and the cathode.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the two adjacent electron blocking layers as taught by Wolk into the electroluminescent element of Thompson in order to that the important interfacial characteristics of the layers can be produced when the transfer unit is prepared and retained during transfer.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Epstein (251) and further in view of Motomatsu (909)

Regarding Claim 15, Thompson (647) fails to exemplify the organic electroluminescent element wherein the phosphorescent compound contained in the light emitting layer is different from the phosphorescent compound contained in electron blocking layer 1.

Thompson discloses in Paragraph [0109], lines 24-25 an emissive layer (light emitting layer) comprising CBP doped with Ir(ppy).

In the same field of endeavor, Epstein teaches Column 3, lines 3-4 using PVK in an electron block layer to improve the device efficiency and brightness. (PVK is luminescent)

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the PVK of Epstein into the device of Thompson with Ir(ppy) as a luminescent material in order to improve the device efficiency and brightness.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Thompson et al (US Patent No. 6,951,694) and further in view of Lamansky (441) and Motomatsu (909).

Regarding Claims 23 , Thompson (647) fails to disclose an organic electroluminescent element emitting white light.

In the same field of endeavor, Thompson (694) teaches Column 20, line 40 white light emission that is of high quality and voltage independent.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the white light of Thompson (694) into the electroluminescent element of Thompson (647) in order to have a high quality and voltage independent emission.

Claims 31, 35 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Thompson (694) and Motomatsu (909).

Regarding Claims 31, 35 and 43, Thompson (647) fails to disclose an organic electroluminescent element emitting white light.

In the same field of endeavor, Thompson (694) teaches Column 20, line 40 white light emission that is of high quality and voltage independent.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the white light of Thompson (694) into the electroluminescent element of Thompson (647) in order to have a high quality and voltage independent emission.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Lamansky (441), Yamazaki (213), Epstein (251) and Motomatsu (909).

Regarding Claim 42 , Thompson fails to exemplify the illumination device wherein a display comprising a liquid crystal cell and the illumination device .

Lamansky teaches in (Paragraph [0010], lines 14-15) using illumination devices (organic light emitting devices (line 1)) in liquid crystal displays because of their bright colors, wide viewing angle and low power requirements.(lines 9-12)

It would have been obvious to one of ordinary skills in the art, at the time of the invention, to incorporate the liquid crystal device of Lamansky into the illumination device of Thompson to provide bright colors, wide viewing angle and low power requirements in the liquid crystal device.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Lamansky (441), Epstein (251) and Motomatsu (909).

Regarding Claims 30 Thompson (647) fails to exemplify the illumination device wherein a display comprising a liquid crystal cell and the illumination device .

Lamansky teaches in (Paragraph [0010], lines 14-15) using illumination devices (organic light emitting devices (line 1)) in liquid crystal displays because of their bright colors, wide viewing angle and low power requirements.(lines 9-12)

It would have been obvious to one of ordinary skills in the art, at the time of the invention, to incorporate the liquid crystal device of Lamansky into the illumination device of Thompson to provide bright colors, wide viewing angle and low power requirements in the liquid crystal device.

Claims 27 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (647) in view of Thompson (694), Yamazaki (213), Epstein (251) and Motomatsu (909).

Regarding Claims 27 and 39 ,Thompson (647) fails to disclose an organic electroluminescent element emitting white light.

In the same field of endeavor, Thompson (694) teaches Column 20, line 40 white light emission that is of high quality and voltage independent.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to incorporate the white light of Thompson (694) into the electroluminescent element of Thompson (647) in order to have a high quality and voltage independent emission.

## *Conclusion*

Examiner's note: Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DONALD L. RALEIGH whose telephone number is (571)270-3407. The examiner can normally be reached on Monday-Friday 7:30AM to 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Donald L Raleigh/
Examiner, Art Unit 2879

/Mariceli Santiago/
Primary Examiner, Art Unit 2879